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ABSTRACT

Curriculum frameworks for North Dakota elementary-secondary education are presented in this document. These frameworks are voluntary and serve to promote interdisciplinary learning, active learning, and student diversity. They are part of a larger systemic approach to improve instruction in the state's schools and to identify content outcomes and student-performance standards. Each section contains: a list of North Dakota educators involved in the framework development; a mission statement for that particular subject area; the graduation outcomes for the state; a list of content outcomes; content outcomes and performance standards for each outcome at grades 4, 8, and graduation; a glossary of terms; and a bibliography. Curriculum frameworks are provided for the following areas: language arts; library media (access to information, information literacy, promotion of lifelong learning); mathematics; science; and social studies. (LMI)

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ED 370 175

NORTH DAKOTA

CURRICULUM FRAMEWORKS

Volume I

Language Arts
Library Media
Mathematics
Science
Social Studies

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North Dakota Department of Public Instruction
Dr. Wayne G. Sanstead, Superintendent
Bismarck, ND
January, 1993

EA 025 780

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NORTH DAKOTA

CURRICULUM FRAMEWORKS

VOLUME I

Dr. Wayne G. Sanstead, Superintendent
North Dakota Department of Public Instruction
Bismarck, North Dakota 58505-0440

January, 1993

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FOREWORD

The most significant feature about the **North Dakota Curriculum Frameworks** is that it is a work by North Dakota educators and administrators for all North Dakotans.

The State **Curriculum Framework** philosophy includes a rationale for offering instructional programs in various content areas, general statements about what the instructional program will do, and how the instructional program will accomplish what it intends to do.

The **Curriculum Frameworks** are important because they create new, higher standards for what students should know and be able to do. They are developed around a balanced and challenging core of common learning. Further, the **Curriculum Frameworks** should promote interdisciplinary learning, encourage active learning, and recognize and respect student diversity.

The **Curriculum Frameworks** are voluntary. It is my hope that these **Frameworks** will have a positive influence on the policies and practices of local school boards, administrators, and most significantly the classroom teacher.

While these **Frameworks** are aimed at improving the content areas, these **Frameworks** are but a part of a larger systemic approach to improving instruction in our schools. As we progress through the 1990s we all will need to be aware of the national movement toward establishing voluntary standards and assessments. In this, I believe our **North Dakota Curriculum Frameworks** have the dynamics and flexibility to incorporate those new standards and assessments as they are developed and as they meet the needs of our students.

Last, again I commend and compliment the North Dakota teachers and administrators who developed and wrote the **Frameworks**, for they indeed will be of historic importance as we mutually seek to improve education in North Dakota.

Wayne G. Sanstead

Dr. Wayne G. Sanstead
Superintendent of Public Instruction

This work was developed under the auspices of the Curriculum Unit, Department of Public Instruction:

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NORTH DAKOTA CONTENT AREA FRAMEWORKS

In response to the public's concern and legislature's request, the state of North Dakota has produced a series of content area frameworks identifying content outcomes and student performance standards. Each document contains: a list of North Dakota educators involved in the development of the framework; a mission statement for that particular subject area; the graduation outcomes for the state of North Dakota; a list of content outcomes; a listing for content outcomes with the performance standards for each outcome at grades 4, 8 and exit; a glossary of terms; and a bibliography. These documents represent the current ideals, based on research of the subject area, knowledge of the student as a learner, knowledge of the process of instruction and an understanding of the current organization of schools.

The content outcomes and performance standards are intended to serve as benchmarks (transition points) for state and local decision making and local curriculum development. They should not be considered to be statements of minimum competencies. The documents are designed with the belief that local curriculum developers will find direction and guidance as they plan for continued improvement in the various subject areas for all students. They also provide a framework for curriculum across the K-12 continuum of learning.

The content outcomes and student performance standards section of the documents should be particularly useful to school districts as they develop local curriculum materials, determine instructional activities and tasks, and design assessment strategies for accountability purposes for their local communities. The content outcomes provide a broad framework for the total program, while the performance standards offer a more specific description of what students must know at grade 4, grade 8, and upon graduation. Districts can use these outcomes and standards to make decisions concerning: **1)** what must be taught in each grade or course (curriculum); **2)** the delivery of instruction; and **3)** student learning (assessment).

It was the intention of the developers to produce a series of documents that were a forward looking expression of the learning opportunities needed by students who will be citizens of the twenty-first century.

A need for restructuring the educational system is evidenced by a great deal of commentary about the current state of education at both the national and local levels. If we are to be responsive to the needs of our students now and in the future we must increase our efforts to create an educational environment that will allow every student to develop to the highest achievement level. High standards and high achievement levels lead to world class standards and world class citizens.

NORTH DAKOTA GRADUATION OUTCOMES

Each student will have the ability to:

1. Apply concepts, generalizations, processes and strategies considered important to specific content areas.

2. Use complex reasoning processes.

3. Work in a cooperative/collaborative manner.

4. Regulate oneself in a variety of situations.

5. Communicate through a variety of products.

6. Gather information in a variety of ways.

NORTH DAKOTA

LANGUAGE ARTS

FRAMEWORK

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THE MISSION STATEMENT OF LANGUAGE ARTS EDUCATION IN NORTH DAKOTA

Language arts empowers all students to learn, grow, and lead in a complex and changing society. Reading, writing, speaking and listening, all integral elements of the study of English, build on prior knowledge and experiences to develop a positive sense of the world and its cultural diversity. These activities provide pleasure and satisfaction in everyday living.

Language arts prepares students to be productive citizens who reflect on and take charge of their lives. They distinguish between language that informs and enhances and language that manipulates and coerces. Effective learners express opinions, think creatively, and solve problems. Practicing language arts skills is an integrated, on-going process necessary for developing maximum potential in a modern technological world.

To be fully literate is to appreciate and to engage in reading, writing, listening and speaking activities that empower feeling, thinking and action in the context of society.

CONTENT OUTCOMES

LANGUAGE ARTS

1. The student reads to understand written materials.

2. The student communicates effectively through writing.

3. The student listens actively to facilitate communication.

4. The student communicates effectively through speaking.

5. The student continues to develop an appreciation of language arts.

LANGUAGE ARTS

CONTENT OUTCOMES AND STUDENT PERFORMANCE STANDARDS

Outcome Statement:

1. THE STUDENT READS TO UNDERSTAND WRITTEN MATERIALS.

Benchmarks/Performance Standards:

By the end of grade 4

The student demonstrates the ability to:

a. find pleasure and satisfaction in reading.

b. use prior knowledge to employ a variety of strategies while reading.

c. apply reading skills and strategies daily for a variety of purposes.

d. increase vocabulary.

e. use higher level thinking skills to comprehend and respond to written materials.

f. respond to, expand, and interpret written materials making connections to previous literacy experiences.

g. integrate reading with speaking, writing, listening, and viewing.

By the end of grade 8

The student demonstrates the ability to:

a. apply reading skills and strategies for a variety of purposes.

b. recognize and adjust to different forms of writing.

c. apply strategies for selecting, learning and extending vocabulary.

d. self-monitor (confirm or correct predictions) while reading to determine if meaning is clear.

Outcome Statement:

1. THE STUDENT READS TO UNDERSTAND WRITTEN MATERIALS.

Benchmarks/Performance Standards:

By the end of grade 8 (continued)

e. evaluate and organize information from a number of resources and personal observations.

f. interpret written materials using background knowledge, literary elements, inferences, and structures.

g. respond to reading text on an individual and group basis, connecting new concepts/ideas to prior knowledge. (cooperative learning)

h. integrate reading with speaking, listening, viewing, and writing experiences.

i. engage in reading for a sustained period of time.

j. learn about self and others through reflection on literature.

k. distinguish between fact and opinion, cause and effect, motive and result, and fantasy and reality. (thinking and reasoning skills)

l. recognize story elements (plot, characterization, setting, theme) from a variety of literary works.

By the end of grade 12 or at exit

The student demonstrates the ability to:

a. identify the varieties of genre (short story, novel, drama, poetry and non-fiction).

b. identify the elements of a variety of genre (plot, theme, setting, conflict, etc.).

c. analyze the use of figurative language (metaphor, simile, personification, etc.).

d. recognize literary techniques (irony, satire, allegory, etc.).

e. develop and apply an increasingly sophisticated vocabulary.

Outcome Statement:

1. THE STUDENT READS TO UNDERSTAND WRITTEN MATERIALS.

Benchmarks/Performance Standards:

By the end of grade 8 (continued)

e. evaluate and organize information from a number of resources and personal observations.

f. interpret written materials using background knowledge, literary elements, inferences, and structures.

g. respond to reading text on an individual and group basis, connecting new concepts/ideas to prior knowledge. (cooperative learning)

h. integrate reading with speaking, listening, viewing, and writing experiences.

i. engage in reading for a sustained period of time.

j. learn about self and others through reflection on literature.

k. distinguish between fact and opinion, cause and effect, motive and result, and fantasy and reality. (thinking and reasoning skills)

l. recognize story elements (plot, characterization, setting, theme) from a variety of literary works.

By the end of grade 12 or at exit

The student demonstrates the ability to:

a. identify the varieties of genre (short story, novel, drama, poetry and non-fiction).

b. identify the elements of a variety of genre (plot, theme, setting, conflict, etc.).

c. analyze the use of figurative language (metaphor, simile, personification, etc.).

d. recognize literary techniques (irony, satire, allegory, etc.).

e. develop and apply an increasingly sophisticated vocabulary.

Outcome Statement:

1. THE STUDENT READS TO UNDERSTAND WRITTEN MATERIALS.

Benchmarks/Performance Standards:

By the end of grade 12 or at exit (continued)

f. interpret a given text for levels of meaning.

g. assess the validity and quality of a selection read.

h. use resource materials to find, evaluate, and synthesize information.

i. make connections between literature and life.

Outcome Statement:

2. THE STUDENT COMMUNICATES EFFECTIVELY THROUGH WRITING.

Benchmarks/Performance Standards:

By the end of grade 4

The student demonstrates the ability to:

a. find pleasure and satisfaction in writing.

b. use writing as a tool for learning and thinking.

c. write daily for a variety of purposes and audiences.

d. use appropriate vocabulary, syntax, and grammar in writing.

e. use various resources during the writing process.

f. integrate writing with speaking, listening, viewing, and reading experiences across the curriculum.

By the end of grade 8

The student demonstrates the ability to:

a. use writing as a tool for learning and thinking.

b. integrate writing with speaking, listening, viewing, and reading experiences across the curriculum.

c. use a variety of structures and strategies to write for different purposes and audiences.

d. extend knowledge of vocabulary, syntax, and grammar through writing.

e. use a variety of resources to gather information for writing.

f. use correct writing mechanics.

g. demonstrate knowledge of concepts and convey meaning, information, and interpretation through writing.

Outcome Statement:

2. THE STUDENT COMMUNICATES EFFECTIVELY THROUGH WRITING.

Benchmarks/Performance Standards:

By the end of grade 8 (continued)

h. demonstrate proficiency in using a writing process which includes planning, writing, and revising.

i. write regularly on self-selected topics.

j. engage in writing for a sustained period of time.

k. extend and enrich writing experiences through technology and multi-media activities.

l. publish completed pieces for a variety of audiences (school newspaper, classroom bulletin board, parents, friends, print media).

By the end of grade 12 or at exit

The student demonstrates the ability to:

a. use writing regularly as a tool for learning and thinking.

b. exhibit a command of the mechanics of the language.

c. demonstrate organizational skills.

d. address a specific audience for a specific purpose.

e. demonstrate fluency in all forms of discourse (exposition, narrative, descriptive, persuasion).

f. expand one's vocabulary through writing.

g. produce a documented paper.

h. explore opportunities for creativity.

Outcome Statement:

3. THE STUDENT LISTENS ACTIVELY TO FACILITATE COMMUNICATION.

Benchmarks/Performance Standards:

By the end of grade 4

The student demonstrates the ability to:

a. integrate listening daily with reading, writing, speaking, and viewing experiences across the curriculum.

b. listen for a variety of purposes using varied resources.

c. extend knowledge and develop vocabulary through listening experiences.

d. demonstrate literal listening.

e. evaluate, analyze, and synthesize information obtained from listening.

By the end of grade 8

The student demonstrates the ability to:

a. listen actively.

b. recognize effective grammar and syntax.

c. expand vocabulary through listening.

d. predict and infer meaning from an oral message.

e. summarize an oral message.

f. listen for a variety of purposes.

g. note relevant information while listening.

h. listen/view media for a variety of purposes.

Outcome Statement:

3. THE STUDENT LISTENS ACTIVELY TO FACILITATE COMMUNICATION.

Benchmarks/Performance Standards:

By the end of grade 4

The student demonstrates the ability to:

a. integrate listening daily with reading, writing, speaking, and viewing experiences across the curriculum.

b. listen for a variety of purposes using varied resources.

c. extend knowledge and develop vocabulary through listening experiences.

d. demonstrate literal listening.

e. evaluate, analyze, and synthesize information obtained from listening.

By the end of grade 8

The student demonstrates the ability to:

a. listen actively.

b. recognize effective grammar and syntax.

c. expand vocabulary through listening.

d. predict and infer meaning from an oral message.

e. summarize an oral message.

f. listen for a variety of purposes.

g. note relevant information while listening.

h. listen/view media for a variety of purposes.

Outcome Statement:

3. THE STUDENT LISTENS ACTIVELY TO FACILITATE COMMUNICATION.

Benchmarks/Performance Standards:

By the end of grade 8 (continued)

i. use prior knowledge to employ a variety of listening strategies.

j. seek meaning of figurative language.

k. recognize stereotypes, biases, and propaganda techniques.

l. listen for enjoyment and entertainment.

By the end of grade 12 or at exit

The student demonstrates the ability to:

a. listen attentively and empathetically.

b. analyze techniques and strategies of speakers.

c. expand vocabulary.

d. distinguish between information and persuasion.

e. interpret and evaluate purpose and content (bias, doublespeak, propaganda, emotional appeals, fallacy, statistics, etc.).

f. recognize non-verbal cues.

g. incorporate new information with prior knowledge and experience.

h. use listening for enjoyment and entertainment.

i. participate actively in communication situations.

Outcome Statement:

4. THE STUDENT COMMUNICATES EFFECTIVELY THROUGH SPEAKING.

Benchmarks/Performance Standards:

By the end of grade 4

The student demonstrates the ability to:

a. integrate speaking with reading, writing, listening, and viewing.

b. use appropriate vocabulary, grammar, word usage, and syntax while speaking.

c. use a variety of resources to gather information in preparing for oral communication.

d. use a variety of organizational strategies to clearly present ideas for various purposes and audiences.

e. clarify personal thinking/understanding through daily oral communication.

By the end of grade 8

The student demonstrates the ability to:

a. speak clearly and expressively about ideas and concerns.

b. develop a variety of speaking styles and vocabulary according to audience and purpose.

c. demonstrate a knowledge of grammar, usage, and syntax while speaking.

d. become increasingly aware of audience feedback.

e. integrate speaking with writing, listening, viewing, and reading experiences.

f. develop an oral presentation that includes preparation, organization, and practice.

g. participate in small or whole-group oral language activities.

h. evaluate the oral presentations of self and others.

Outcome Statement:

4. THE STUDENT COMMUNICATES EFFECTIVELY THROUGH SPEAKING.

Benchmarks/Performance Standards:

By the end of grade 8 (continued)

i. use nonverbal factors to enhance speaking.

j. develop effective discussion skills.

By the end of grade 12 or at exit

The student demonstrates the ability to:

a. analyze the speaking situation, formal (public speaking, discussion, debate, oral interpretation, etc.) and informal.

b. apply audience analysis to speaking situation (time of day, size of group, age, background, etc.).

c. gather supporting materials and test them for credibility, reasoning, and evidence.

d. apply elements of organization (introduction, transitions, thesis, body, and conclusion).

e. employ effective delivery techniques (rate, volume, tone, articulation, posture, gesture, eye contact, etc.).

f. use specific, expressive, and suitable language.

g. self-evaluate speaking skills.

Outcome Statement:

5. THE STUDENT CONTINUES TO DEVELOP AN APPRECIATION OF LANGUAGE ARTS.

Benchmarks/Performance Standards:

By the end of grade 4

The student demonstrates the ability to:

a. use language effectively and responsibly to create knowledge, meaning, and community.

b. recognize and value a diversity of cultures, viewpoints, and individual needs.

c. reflect on and evaluate personal language use.

d. recognize and evaluate the language used by others.

By the end of grade 8

The student demonstrates the ability to:

a. use language effectively and responsibly to create knowledge, meaning, and community.

b. recognize and value a diversity of cultures, viewpoints, and individual needs.

c. reflect on and evaluate personal language use.

d. recognize and evaluate the language used by others.

By the end of grade 12 or at exit

The student demonstrates the ability to:

a. use language effectively and responsibly to create knowledge, meaning, and community.

b. recognize and value a diversity of cultures, viewpoints, and individual needs.

c. reflect on and evaluate personal language use.

d. recognize and evaluate the language used by others.

SELECTED LIST OF WORKS CONSULTED

Arizona Essential Skills: Literature, Arizona Department of Education, Phoenix, 1992.

Core Course Proficiencies: English (Language Arts), New Jersey State Department of Education, Trenton, 1991.

The English Coalition Conference: Democracy Through Language, edited by Richard Lloyd-Jones and Andrea A. Luns, NCTE, Urbana, IL, 1989.

English-Language Arts: Model Curriculum Standards Grades Nine Through Twelve, California State Board of Education, Sacramento, 1991.

"Framework for the Development of an English/Language Arts Scope and Sequence," Vermont Department of Education, Montpelier, 1986.

A Guide to Curriculum Planning in English Language Arts, Wisconsin Department of Public Instruction, Madison, 1988.

A Guide to Curriculum Planning in Reading, Wisconsin Department of Public Instruction, Madison, 1986.

Model Learner Outcomes for Language Arts Education, Minnesota Department of Education, Little Canada, MN, 1988.

Wells, Gordon, "Creating the Conditions to Encourage Literate Thinking," *Educational Leadership*, Volume 47, Number 6, March 1990, pp. 13-17.

NORTH DAKOTA

LIBRARY MEDIA

FRAMEWORK

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THE MISSION STATEMENT OF LIBRARY MEDIA EDUCATION IN NORTH DAKOTA

The mission of the school library media program is to ensure that students and staff will have free access to information, unimpeded by social, cultural, economic, geographic or technological constraints. Students and staff will become effective users of ideas and information to function successfully in a rapidly changing, complex, technological world. They must acquire information, technological and communication skills in order to become independent lifelong learners. The school library media program will promote literacy and the enjoyment of reading, viewing, and listening for young people of all ages and stages of development. Aesthetic and critical experience with literature, visual and oral media prepares students to become more understanding of themselves and of the diversity of the human condition and more appreciative of the importance of the creative experience.

The school library media program provides leadership and expertise in the use of information and instructional technologies in every curriculum area. The school library media specialist cooperates with faculty, administrators and students in curriculum planning; assumes a leadership role in the use of resources and technologies in the school; promotes effective use of instructional technologies; and facilitates their full integration into the curriculum.

CONTENT OUTCOMES

LIBRARY/MEDIA

1. The student locates, selects and uses a variety of information sources.

2. The learner possesses an awareness of and an ability to use present-day technologies to adapt to a changing world.

3. The student applies critical thinking skills in interpreting, analyzing and evaluating information.

4. The student is a confident, responsible, effective consumer and creator of ideas and information.

5. The student values and uses the skills and attitudes of an independent lifelong learner.

6. The student acknowledges a wide diversity of cultures, points of view, and individual needs.

7. The student demonstrates ethical use of the transfer of information.

8. The student appreciates reading, viewing and listening for enjoyment.

LIBRARY/MEDIA

CONTENT OUTCOMES AND STUDENT PERFORMANCE STANDARDS

Outcome Statement:

1. THE STUDENT LOCATES, SELECTS AND USES A VARIETY OF INFORMATION SOURCES.

Benchmarks/Performance Standards:

By the end of grade 4

The student demonstrates the ability to:

a. find material using the library cataloging system.

b. use the library for information and enjoyment.

c. use reference materials, such as almanac, encyclopedia, dictionary, thesaurus and atlas.

d. use technological tools to enhance learning opportunities.

By the end of grade 8

The student demonstrates the ability to:

a. compare, differentiate, understand, apply and relate information and facts using library resources.

b. use the information resources and personnel of the school, community and other libraries.

c. use reference materials such as indexes, periodicals, specialized subject encyclopedias/dictionaries.

d. use technological tools to research, capture and manipulate information for a specific purpose.

Outcome Statement:

1. THE STUDENT LOCATES, SELECTS AND USES A VARIETY OF INFORMATION SOURCES.

Benchmarks/Performance Standards:

By the end of grade 12 or at exit

The student demonstrates the ability to:

a. evaluate sources that represent diversity of experiences, opinions, social and cultural perspectives.

b. apply different information formats appropriately.

c. synthesize information obtained from research.

Outcome Statement:

2. THE LEARNER POSSESSES AN AWARENESS OF AND AN ABILITY TO USE PRESENT-DAY TECHNOLOGIES TO ADAPT TO A CHANGING WORLD.

Benchmarks/Performance Standards:

By the end of grade 4

The student demonstrates the ability to:

a. extract information from an audio and/or visual source.

b. operate age-appropriate computer software.

c. differentiate among equipment used for retrieving information.

d. search on-line catalog.

By the end of grade 8

The student demonstrates the ability to:

a. create and produce an audiovisual production.

b. search an electronic database.

c. recognize the impact of technology on information distribution and retrieval.

d. operate any equipment necessary to use the nonprint or electronic resources in the school.

By the end of grade 12 or at exit

The student demonstrates the ability to:

a. understand technique of searching in Boolean logic.

b. create an audiovisual presentation combining various technologies.

c. apply different information formats appropriately.

Outcome Statement:

3. THE STUDENT APPLIES CRITICAL THINKING SKILLS IN INTERPRETING, ANALYZING AND EVALUATING INFORMATION.

Benchmarks/Performance Standards:

By the end of grade 4

The student demonstrates the ability to:

a. differentiate between fact and fiction.

b. analyze information in terms of questions to be explored.

c. choose data based on content, format, timeliness, literary style, and type/genre of the resources available.

d. categorize information into appropriate subjects.

By the end of grade 8

The student demonstrates the ability to:

a. classify materials by literary genre.

b. discern stereotypes, biases, and propaganda techniques.

c. determine main purpose and reliability of material.

By the end of grade 12 or at exit

The student demonstrates the ability to:

a. use evaluative criteria such as relevance, accuracy, authority and general quality, in making judgments about the message.

b. exercise thinking skills to interpret the relationships between events and the reporting of those events by media.

c. use a logical research process to arrive at an informed decision.

d. apply research data to qualify and quantify information.

Outcome Statement:

4. THE STUDENT IS A CONFIDENT, RESPONSIBLE, EFFECTIVE CONSUMER AND CREATOR OF IDEAS AND INFORMATION.

Benchmarks/Performance Standards:

By the end of grade 4

The student demonstrates the ability to:

a. follow directions to reach a goal.

b. use questions and discussion to clarify inquiry or task.

c. understand and locate, using both intellectual and physical knowledge, organization systems (part, class, location, order, relation, intellectual responsibility) used in libraries and information resources.

d. make simple creative presentations for enjoyment of self and others (read-aloud, picture/storyboard/books, display, etc.).

e. identify and understand different genres and formats of information.

f. use basic audiovisual and computer equipment to facilitate learning.

By the end of grade 8

The student demonstrates the ability to:

a. explain task and document information retrieval process for others using standardized formats.

b. generate questions which invoke the information retrieval process.

c. locate and retrieve information and data from print, nonprint, and computerized sources using multi-step search strategy.

d. develop ideas through discussion, inquiry, documentation, draft, revision, and presentation to others.

e. recast retrieved information into a variety of formats (aesthetic and informational) selected for presentation, by using audiovisual and computer equipment.

Outcome Statement:

4. THE STUDENT IS A CONFIDENT, RESPONSIBLE, EFFECTIVE CONSUMER AND CREATOR OF IDEAS AND INFORMATION.

Benchmarks/Performance Standards:

By the end of grade 8 (continued)

f. discriminate between type, purpose, and quality of information and recognize bias and stereotype.

g. understand the variety of information available, and its relationship to free access to ideas and retrieval resources such as, libraries, databases and networks.

h. enjoy aesthetic presentations in a variety of genres.

i. understand the importance of creativity to society and personal health.

By the end of grade 12 or at exit

The student demonstrates the ability to:

a. identify search strategy, using various formats and technologies to request information from libraries, databases, and networks local and national.

b. create retrieval tools using various complex organization systems (index, database, diagram, programming, hyperstack, etc.) for own and others' use and appreciation.

c. synthesize new information from inquiries in and across disciplines and a variety of formats, and evaluate finished productions.

d. consider and defend new ideas, and recognize and interpret media messages, including the persuasive methods inherent in some media messages.

e. participate alone and with others in creative and aesthetic endeavor.

Outcome Statement:

5. THE STUDENT VALUES AND USES THE SKILLS AND ATTITUDES OF AN INDEPENDENT LIFELONG LEARNER.

Benchmarks/Performance Standards:

By the end of grade 4

The student demonstrates the ability to:

a. select materials of interest and appropriate level.

b. locate materials by general interest based on the ten Dewey Decimal classifications.

c. identify materials in the fiction, nonfiction and reference collections.

d. classify materials by literary genre (mysteries, folktales, biographies, etc.)

e. identify and operate a variety of equipment.

By the end of grade 8

The student demonstrates the ability to:

a. use listening and viewing skills in selecting and evaluating materials.

b. locate the correct source for specific information.

c. identify the types of information available in newspapers and periodicals.

d. prepare reports from a variety of sources.

e. select appropriate sources to meet personal information needs.

f. demonstrate the ability to find answers to personal goals.

Outcome Statement:

5. THE STUDENT VALUES AND USES THE SKILLS AND ATTITUDES OF AN INDEPENDENT LIFELONG LEARNER.

Benchmarks/Performance Standards:

By the end of grade 12 or at exit

The student demonstrates the ability to:

a. develop personal criteria for evaluating and selecting materials that are appropriate to need and interest.

b. locate current information using periodicals, indexes, etc.

c. use public library and community resources, and interlibrary loan to acquire information.

d. locate all types of materials and operate the accompanying equipment.

e. use computers and software as a communication tool.

f. pursue lifelong learning through a variety of resources and technologies.

Outcome Statement:

6. THE STUDENT ACKNOWLEDGES A WIDE DIVERSITY OF CULTURES, POINTS OF VIEW, AND INDIVIDUAL NEEDS.

Benchmarks/Performance Standards:

By the end of grade 4

The student demonstrates the ability to:

a. use different kinds of literature, including multicultural, gender-free materials.

b. read two contrasting paragraphs and discuss the differences.

c. select books on varying topics independently.

By the end of grade 8

The student demonstrates the ability to:

a. identify biases and stereotypes in materials.

b. distinguish between relevant and irrelevant information.

c. determine that collections and technologies are sources of materials that promote cultural literacy, multicultural awareness and interpersonal needs.

d. discuss worldwide cultural differences through diverse reading experiences.

By the end of grade 12 or at exit

The student demonstrates the ability to:

a. select materials according to appropriate criteria, such as being relevant, accurate, authoritative, current, and of appropriate quality and level of difficulty and format.

b. present reports/programs that celebrate cultural diversity.

c. organize and synthesize information obtained from research.

d. understand the consequences to society of the use of fallacy and bias in all forms of media.

Outcome Statement:

7. THE STUDENT DEMONSTRATES ETHICAL USE OF THE TRANSFER OF INFORMATION.

Benchmarks/Performance Standards:

By the end of grade 4

The student demonstrates the ability to:

a. interpret information and reports without plagiarizing.

b. state the sources of information in an appropriate bibliographic format.

c. understand the concept of copyright.

By the end of grade 8

The student demonstrates the ability to:

a. understand copyright rights and responsibilities.

b. compile bibliographies according to an assigned style/format.

By the end of grade 12 or at exit

The student demonstrates the ability to:

a. understand and adhere to copyright law and regulations for all formats.

b. understand the application process for obtaining copyright, trademark, patent and other intellectual property protections.

c. use bibliographies to expand research topics.

Outcome Statement:

8. THE STUDENT APPRECIATES READING, VIEWING AND LISTENING FOR ENJOYMENT.

Benchmarks/Performance Standards:

By the end of grade 4

The student demonstrates the ability to:

a. select print and nonprint materials of personal interest.

b. develop an interest in current periodicals and newspapers.

c. listen to oral presentations.

d. read and retell literature for enjoyment and entertainment.

By the end of grade 8

The student demonstrates the ability to:

a. use a variety of libraries (public, special, etc.) for personal enjoyment.

b. select materials for leisure reading.

c. evaluate a reading, viewing and listening experience critically.

d. value award-winning literature.

e. list reading, viewing and listening as pleasurable activities.

Outcome Statement:

8. THE STUDENT APPRECIATES READING, VIEWING AND LISTENING FOR ENJOYMENT.

Benchmarks/Performance Standards:

By the end of grade 12 or at exit

The student demonstrates the ability to:

a. select books with more complex levels of expression and comprehension.

b. evaluate reading, viewing and listening experiences critically.

c. answer own questions by reading, viewing and listening.

d. schedule time to personally read, view and listen for pleasure.

e. value reading as a lifelong activity.

SELECTED LIST OF WORKS CONSULTED

Information Power: Guidelines for School Library Media Programs, American Library Association, Chicago, IL, 1988.

A Guide to Program Development: Learning Resources and Technology, Connecticut Department of Education, Hartford, 1991.

Model Learner Outcomes for Educational Media and Technology, Minnesota Department of Education, White Bear Lake, 1989.

NORTH DAKOTA

MATHEMATICS

FRAMEWORK

North Dakota Mathematics Curriculum Framework Committee

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THE MISSION STATEMENT OF MATHEMATICS EDUCATION IN NORTH DAKOTA

The arithmetic skills of the past are no longer sufficient if our students are to be productive citizens for tomorrow.

We believe the time has come for redefining the nature of mathematics education in North Dakota. It is essential that all students be engaged in a program that contains appropriate mathematical content and expands their knowledge base to become active, flexible thinkers and users of mathematics. Towards this end, the K-12 mathematics framework articulates five general goals for all students--regardless of race, national origin, sex, or disability--that they: **(1)** learn to value mathematics, **(2)** become confident in their ability to do mathematics, **(3)** become mathematical problem solvers, **(4)** learn to communicate mathematically, and **(5)** learn to reason mathematically. Learning experiences must cycle between using problems to motivate knowledge base development and using the knowledge base to solve problems.

Today's society expects schools to ensure that all students have an opportunity to become mathematically literate, are capable of extending their learning, have an equal opportunity to learn, and become informed citizens capable of understanding issues in a technological society. As society changes, so must its schools. It is not enough to change the focus of mathematics content. It is equally important to change attitudes, assessments, materials, teaching strategies, and support for mathematics education. This framework is the beginning of the change process that is necessary, if we are to empower our students to broaden their career and economic horizons and to adapt with the changing times.

CONTENT OUTCOMES

MATHEMATICS

1. The student develops problem-solving abilities for application in real life situations.

2. The student develops and practices effective communication using mathematical ideas and relationships.

3. The student applies reasoning skills to develop, analyze and defend logical arguments.

4. The student recognizes mathematics as a connected body of knowledge that is an integral part of society.

5. The student selects and uses appropriate technology/materials related to mathematics.

6. The student recognizes the significant role of mathematics throughout history, as well as its present and future relevance.

7. The student demonstrates confidence in using mathematics.

8. The student understands and applies number concepts to calculations and estimations.

9. The student applies two and three dimensional geometric concepts to solve problems.

10. The student uses patterns, relationships, and algebraic concepts to solve problems.

11. The student uses data analysis, probability, and statistical methods to formulate solutions to problems.

12. The student recognizes and understands the structure of mathematics in number systems and theory.

13. The student demonstrates understanding of concepts related to trigonometry.

14. The student demonstrates understanding of concepts related to discrete structures.

15. The student demonstrates understanding of concepts related to calculus.

CONTENT OUTCOMES AND STUDENT PERFORMANCE STANDARDS

Outcome Statement:

1. THE STUDENT DEVELOPS PROBLEM-SOLVING ABILITIES FOR APPLICATION IN REAL LIFE SITUATIONS.

Benchmarks/Performance Standards:

By the end of grade 4

The student demonstrates the ability to:

a. develop, apply, and communicate strategies to solve a wide variety of problems.

b. verify and interpret results.

By the end of grade 8

The student demonstrates the ability to:

a. develop and apply a variety of strategies to solve problems, with emphasis on multi-step and non-routine problems.

b. verify and interpret results and apply solutions and strategies to new problem situations.

By the end of grade 12 or at exit

The student demonstrates the ability to:

a. use, with increasing confidence, appropriate integrated mathematical problem-solving strategies and apply them to solve problems from within and outside mathematics.

b. apply the process of mathematical modeling to real world problem situations.

c. determine, collect, organize and analyze the relevant data needed to solve real world problems.

Outcome Statement:

2. THE STUDENT DEVELOPS AND PRACTICES EFFECTIVE COMMUNICATION USING MATHEMATICAL IDEAS AND RELATIONSHIPS.

Benchmarks/Performance Standards:

By the end of grade 4

The student demonstrates the ability to:

a. relate physical materials, pictures, and diagrams to mathematical ideas.

b. discuss, write about and illustrate mathematical concepts and relationships.

c. reflect upon and clarify thinking about mathematical ideas and situations.

By the end of grade 8

The student demonstrates the ability to:

a. model situations using oral, written, graphical, algebraic, and multimedia techniques.

b. use appropriate communication skills to research, interpret, questions, evaluate, and present mathematical ideas.

By the end of grade 12 or at exit

The student demonstrates the ability to:

a. read, reflect and clarify thinking about mathematical ideas and relationships.

b. formulate and express, orally and in writing, mathematical definitions, generalizations and ideas.

c. use mathematical notation to facilitate the simplification of mathematical ideas and relationships.

Outcome Statement:

3. THE STUDENT APPLIES REASONING SKILLS TO DEVELOP, ANALYZE AND DEFEND LOGICAL ARGUMENTS.

Benchmarks/Performance Standards:

By the end of grade 4

The student demonstrates the ability to:

a. use models, known facts, properties and relationships.

b. use patterns and relationships to analyze mathematical situations and draw conclusions.

By the end of grade 8

The student demonstrates the ability to:

a. use logical reasoning skills to make and evaluate mathematical conjectures and arguments.

By the end of grade 12 or at exit

The student demonstrates the ability to:

a. use a given generalization to aid in solving specific problems.

b. follow a logical argument and judge its validity.

c. construct, test, and/or validate a logical argument using inductive or deductive reasoning.

Outcome Statement:

4. THE STUDENT RECOGNIZES MATHEMATICS AS A CONNECTED BODY OF KNOWLEDGE THAT IS AN INTEGRAL PART OF SOCIETY.

Benchmarks/Performance Standards:

By the end of grade 4

The student demonstrates the ability to:

a. recognize and develop relationships among different topics in mathematics, other curricular areas and the physical world.

By the end of grade 8

The student demonstrates the ability to:

a. recognize relationships within and among topics in mathematics and their applications in other disciplines.

b. use mathematics in describing the physical world.

By the end of grade 12 or at exit

The student demonstrates the ability to:

a. recognize equivalent representations of the same concept.

b. recognize and use the connections among and between mathematical topics.

c. recognize and use the connections between mathematics and other disciplines.

Outcome Statement:

5. THE STUDENT SELECTS AND USES APPROPRIATE TECHNOLOGY/MATERIALS RELATED TO MATHEMATICS.

Benchmarks/Performance Standards:

By the end of grade 4

The student demonstrates the ability to:

a. investigate real world concepts and appropriate applications in mathematics.

b. learn to use technology/materials as a tool to explore and model ideas and for processing data.

By the end of grade 8

The student demonstrates the ability to:

a. use appropriate technology/materials to calculate, explore mathematical concepts, and process data.

b. investigate the application of technology in society.

By the end of grade 12 or at exit

The student demonstrates the ability to:

a. use appropriate technology/materials to explore and/or discover the relationships among various mathematical concepts.

b. use appropriate technology/materials to explore and/or discover the relationship between a real world problem and an appropriate mathematical model.

c. use technology to process data.

Outcome Statement:

6. THE STUDENT RECOGNIZES THE SIGNIFICANT ROLE OF MATHEMATICS THROUGHOUT HISTORY, AS WELL AS ITS PRESENT AND FUTURE RELEVANCE.

Benchmarks/Performance Standards:

By the end of grade 4

The student demonstrates the ability to:

a. describe how math was used in history, is used in daily life and may be used in the future.

By the end of grade 8

The student demonstrates the ability to:

a. discuss the impact of other cultures, individuals, and events on the development of mathematics.

By the end of grade 12 or at exit

The student demonstrates the ability to:

a. discuss the historical aspects of mathematics and the resulting impact on civilization.

b. discuss the changing role of mathematics.

Outcome Statement:

7. THE STUDENT DEMONSTRATES CONFIDENCE IN USING MATHEMATICS.

Benchmarks/Performance Standards:

By the end of grade 4

The student demonstrates the ability to:

a. show evidence that mathematics is used in daily activities.

b. persevere in mathematical tasks showing interest, curiosity and inventiveness.

By the end of grade 8

The student demonstrates the ability to:

a. solve problems, communicate ideas, and reason.

b. persevere in mathematical tasks.

By the end of grade 12 or at exit

The student demonstrates the ability to:

a. show evidence that mathematics is a common human activity.

b. persevere in mathematical tasks showing interest, curiosity, and inventiveness.

Outcome Statement:

8. THE STUDENT UNDERSTANDS AND APPLIES NUMBER CONCEPTS TO CALCULATIONS AND ESTIMATIONS.

Benchmarks/Performance Standards:

By the end of grade 4

The student demonstrates the ability to:

a. model, explain and develop proficiency with basic facts and algorithms.

b. use a variety of mental and technological computation and estimation techniques.

c. apply appropriate estimation strategies in working with quantities, measurement, computation and problem solving.

By the end of grade 8

The student demonstrates the ability to:

a. compute and estimate with whole numbers, fractions, decimals, integers, rational, and real numbers.

b. select and use appropriate methods for computation and estimation.

By the end of grade 12 or at exit

The student demonstrates the ability to:

a. analyze and explain procedures for computation as well as techniques for estimation.

b. apply appropriate computation and estimation skills to attain reasonable solutions.

Outcome Statement:

9. THE STUDENT APPLIES TWO AND THREE DIMENSIONAL GEOMETRIC CONCEPTS TO SOLVE PROBLEMS.

Benchmarks/Performance Standards:

By the end of grade 4

The student demonstrates the ability to:

a. describe, model, draw, and classify two and three dimensional shapes.

b. investigate and predict results of combining, subdividing and changing two and three dimensional shapes.

By the end of grade 8

The student demonstrates the ability to:

a. investigate geometric properties, discover and apply relationships, and develop spatial sense.

b. develop models that provide a perspective to analyze and solve problems.

By the end of grade 12 or at exit

The student demonstrates the ability to:

a. interpret and draw two and three dimensional models to represent problem situations and apply properties of figures.

b. classify figures in terms of congruence and similarity and apply these relationships using transformations, coordinates, and vectors where appropriate.

Outcome Statement:

10. THE STUDENT USES PATTERNS, RELATIONSHIPS, AND ALGEBRAIC CONCEPTS TO SOLVE PROBLEMS.

Benchmarks/Performance Standards:

By the end of grade 4

The student demonstrates the ability to:

a. recognize, describe, extend and create a wide variety of patterns.

b. represent and describe mathematical relationships including the use of variables and open sentences to express relationships.

By the end of grade 8

The student demonstrates the ability to:

a. develop and use tables, graphs, and rules to identify properties and relationships.

b. investigate patterns in number sequences, make predictions, and formulate verbal rules to describe patterns.

c. use a variety of methods to solve linear equations and informally investigate inequalities and nonlinear equations.

By the end of grade 12 or at exit

The student demonstrates the ability to:

a. explore, represent, and analyze functions and other situations that involve variable quantities in a variety of ways, including but not limited to expressions, equations, inequalities, tables, graphs and matrices.

b. manipulate expressions and solve equations and inequalities.

Outcome Statement:

11. THE STUDENT USES DATA ANALYSIS, PROBABILITY, AND STATISTICAL METHODS TO FORMULATE SOLUTIONS TO PROBLEMS.

Benchmarks/Performance Standards:

By the end of grade 4

The student demonstrates the ability to:

a. collect, organize and describe data.

b. formulate and solve problems that involve collecting and analyzing data.

c. explore concepts of chance.

By the end of grade 8

The student demonstrates the ability to:

a. systematically collect, organize, describe, and evaluate data.

b. model situations by the use of experiments, simulations, or sample spaces to determine probability.

c. make and compare predictions based on experimental or theoretical probability.

By the end of grade 12 or at exit

The student demonstrates the ability to:

a. construct, draw inferences, and predict outcomes from data expressed in a variety of ways.

b. understand sampling and recognize its role in statistics.

Outcome Statement:

12. THE STUDENT RECOGNIZES AND UNDERSTANDS THE STRUCTURE OF MATHEMATICS IN NUMBER SYSTEMS AND THEORY.

Benchmarks/Performance Standards:

By the end of grade 4

The student demonstrates the ability to:

a. construct number meanings through real world experiences and the use of physical materials.

b. understand our numeration system by relating counting, grouping and place-value concepts.

c. identify attributes such as length, capacity, weight, area, volume, time, money, temperature, and angle.

By the end of grade 8

The student demonstrates the ability to:

a. apply order relations for whole numbers, fractions, decimals, integers, rational and real numbers.

b. understand how arithmetic operations are related to one another.

c. apply number theory concepts (e.g., primes, factors, and multiples) in mathematical problems and real world situations.

By the end of grade 12 or at exit

The student demonstrates the ability to:

a. compare the real number system and its various subsystems with regard to their structural characteristics.

b. understand the systemic nature of algebraic procedures.

c. recognize that seemingly different mathematical systems may be essentially the same.

Outcome Statement:

13. THE STUDENT DEMONSTRATES UNDERSTANDING OF CONCEPTS RELATED TO TRIGONOMETRY.

Benchmarks/Performance Standards:

By the end of grade 4

The student demonstrates the ability to:

a. recognize similarities among figures including similar triangles.

By the end of grade 8

The student demonstrates the ability to:

a. construct, identify, classify, and measure angles and triangles.

b. understand and apply properties of the right triangle.

By the end of grade 12 or at exit

The student demonstrates the ability to:

a. apply basic trigonometric ratios to solve real world problems, using appropriate technology.

b. explore periodic real world phenomena using the sine and cosine functions.

Outcome Statement:

14. THE STUDENT DEMONSTRATES UNDERSTANDING OF CONCEPTS RELATED TO DISCRETE STRUCTURES.

Benchmarks/Performance Standards:

By the end of grade 4

The student demonstrates the ability to:

a. distinguish sets and recognize paths with limiting conditions.

By the end of grade 8

The student demonstrates the ability to:

a. understand the difference between finite and infinite sets.

b. recognize patterns in sequences.

By the end of grade 12 or at exit

The student demonstrates the ability to:

a. represent finite sets with appropriate notation and use basic set relations and operations.

b. represent problem situations using discrete mathematics concepts such as finite graphs, matrices, sequences, and recurrence relations.

Outcome Statement:

15. THE STUDENT DEMONSTRATES UNDERSTANDING OF CONCEPTS RELATED TO CALCULUS.

Benchmarks/Performance Standards:

By the end of grade 4

The student demonstrates the ability to:

a. describe characteristics of infinity, limiting factors and sequences.

By the end of grade 8

The student demonstrates the ability to:

a. investigate the concept of limit.

By the end of grade 12 or at exit

The student demonstrates the ability to:

a. determine maximum and minimum points of a graph and interpret the results in problem situations.

b. describe the ideas of convergence and limit as related to infinite sequences.

SELECTED LIST OF WORKS CONSULTED

Curriculum and Evaluation Standards for School Mathematics, National Council of Teachers of Mathematics, Reston, VA, 1989.

Mathematics Proficiency Guide, Indiana Department of Education, Indianapolis.

Model Learner Outcomes for Mathematics Education, Minnesota Department of Education, St. Paul, 1991.

NORTH DAKOTA

SCIENCE

FRAMEWORK

North Dakota Science Curriculum Framework Committee

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THE MISSION STATEMENT OF SCIENCE EDUCATION IN NORTH DAKOTA

The terms of human existence can be expected to change significantly during future generations. Science and technology will be at the center of that change. To manage this change and, at the same time, to preserve our democratic society, a scientifically informed, active, and thinking society is imperative.

The mission of science education in North Dakota is to ensure that each student: **1)** recognizes the importance of lifelong learning in science and technology; **2)** uses science as a process to conduct investigations, support findings, and communicate results, **3)** demonstrates knowledge of scientific concepts and principles and relates them to common themes of science--the nature of science, systems, patterns, energy and matter, cause and effect, and models, **4)** recognizes the interrelationships among science, technology, environment and society, **5)** applies science concepts and complex thinking skills, as appropriate, in decision making; and **6)** is aware of the history and philosophy of science, and recognizes the contributions of various cultures to science.

CONTENT OUTCOMES

SCIENCE

1. The student recognizes the importance of lifelong learning in science and technology.

2. The student uses science as a process to conduct investigations, support findings, and communicate results.

3. The student demonstrates knowledge of scientific concepts and principles, and relates them to common themes of science--the nature of science, systems, patterns, energy and matter, cause and effect, and models.

4. The student recognizes the interrelationships among science, technology, environment and society.

5. The student applies science concepts and complex thinking skills, as appropriate, in decision making.

6. The student is aware of the history and philosophy of science and recognizes the contributions of various cultures to science.

DEFINITION OF THEMES

Cause and effect: Cause and effect are always present in an event, occur in a sequential order, and have a statistical probability.

Energy and matter: Energy has the ability to cause change. Matter is the stuff of which all things are composed.

Models: A model is a representation of a system or natural phenomenon that explains that system or natural phenomenon.

Nature of science: The nature of science is the using of science as a process including the use of tools and technology.

Patterns: These patterns include both patterns of change and constancy in balanced proportions with some sense of order and regularity.

Systems: A group of things or events that can be defined by boundaries.

SCIENCE

CONTENT OUTCOMES AND STUDENT PERFORMANCE STANDARDS

Outcome Statement:

1. THE STUDENT RECOGNIZES THE IMPORTANCE OF LIFELONG LEARNING IN SCIENCE AND TECHNOLOGY.

Benchmarks/Performance Standards:

By the end of grade 4

The student demonstrates the ability to:

a. generate questions about the world based on observation.

b. identify people in the community who work in scientific fields.

c. identify community needs.

d. recognize enjoyable aspects of science.

e. recognize a variety of tools and technology used in science.

By the end of grade 8

The student demonstrates the ability to:

a. apply scientific knowledge to real life situations.

b. understand and use science to make informed choices.

c. recognize career possibilities in science.

d. develop imaginative solutions to community needs.

e. recognize that science can provide enjoyment as a leisure activity.

f. explain how technology affects the student's life.

Outcome Statement:

1. **THE STUDENT RECOGNIZES THE IMPORTANCE OF LIFELONG LEARNING IN SCIENCE AND TECHNOLOGY.**

   Benchmarks/Performance Standards:

   By the end of grade 12 or at exit

   The student demonstrates the ability to:

   a. apply and integrate scientific knowledge to real life situations.

   b. explore career possibilities in science.

   c. actively explore natural phenomena.

   d. recognize that lifelong learning is important due to the varying context of situations.

   e. recognize that science can provide enjoyment as a leisure activity.

   f. contribute to the community and its needs.

   g. explain how technology impacts the present and the future.

Outcome Statement:

2. THE STUDENT USES SCIENCE AS A PROCESS TO CONDUCT INVESTIGATIONS, SUPPORT FINDINGS, AND COMMUNICATE RESULTS.

Benchmarks/Performance Standards:

By the end of grade 4

The student demonstrates the ability to:

a. create questions based on observations and suggest possible solutions.

b. use simple scientific tools in conducting investigations.

c. communicate in a variety of ways (oral, written, visual) using technology when appropriate.

By the end of grade 8

The student demonstrates the ability to:

a. identify problems, create questions based on observations, and suggest possible solutions.

b. recognize what constitutes data.

c. collect, record and organize data to form conclusions and generate new questions.

d. use interdisciplinary skills in science.

e. use a variety of resources, technology and tools of science.

f. develop an opinion about science issues and discuss these issues with others.

g. communicate effectively in a variety of ways (oral, written, visual) using technology, when appropriate.

Outcome Statement:

2. THE STUDENT USES SCIENCE AS A PROCESS TO CONDUCT INVESTIGATIONS, SUPPORT FINDINGS, AND COMMUNICATE RESULTS.

Benchmarks/Performance Standards:

By the end of grade 12 or at exit

The student demonstrates the ability to:

a. solve problems in various forms (e.g., mathematically, graphically, experimentally, etc.).

b. collect accurate and precise data, determine relationships among the data, and use the relationships to solve problems.

c. recognize that science is a changing body of knowledge.

d. integrate interdisciplinary skills in science.

e. evaluate and use a variety of resources.

f. integrate communication skills in a variety of ways (oral, written, visual) using appropriate technology.

g. design and complete an experiment.

h. formulate, support and defend an opinion using scientific evidence.

i. recognize the role of creativity in problem solving.

Outcome Statement:

3. THE STUDENT DEMONSTRATES KNOWLEDGE OF SCIENTIFIC CONCEPTS AND PRINCIPLES, AND RELATES THEM TO COMMON THEMES OF SCIENCE--THE NATURE OF SCIENCE, SYSTEMS, PATTERNS, ENERGY AND MATTER, CAUSE AND EFFECT, AND MODELS.

Benchmarks/Performance Standards:

By the end of grade 4

The student demonstrates the ability to:

a. identify the components of basic biological and physical systems.

b. identify change as a process in nature.

c. identify the phases of matter.

d. identify forms of energy.

e. recognize cause and effect relationships in nature and society.

f. identify models.

By the end of grade 8

The student demonstrates the ability to:

a. identify the components of biological and physical systems and communicate interactions.

b. identify the importance of change and constancy in nature.

c. predict the results of change.

d. describe the conversion of one form of energy to another.

e. recognize how matter changes phase.

f. describe cause and effect relationships in nature and society.

g. construct and demonstrate a model of a natural phenomenon or system.

Outcome Statement:

3. **THE STUDENT DEMONSTRATES KNOWLEDGE OF SCIENTIFIC CONCEPTS AND PRINCIPLES, AND RELATES THEM TO COMMON THEMES OF SCIENCE--THE NATURE OF SCIENCE, SYSTEMS, PATTERNS, ENERGY AND MATTER, CAUSE AND EFFECT, AND MODELS.**

Benchmarks/Performance Standards:

By the end of grade 12 or at exit

The student demonstrates the ability to:

a. make predictions based on models, observations and experiments.

b. demonstrate appropriate units of measurement.

c. analyze biological, chemical and physical systems, identify their components and describe their interactions.

d. evaluate and predict change as a process in nature.

e. analyze conversion of energy from one form to another.

f. analyze changes in phase of matter.

g. recognize the relationship between energy and matter.

h. compare and contrast cause and effect relationships in physical, biological and chemical systems.

i. use a physical, conceptual or mathematical model to enhance understanding of a system or natural phenomena.

Outcome Statement:

4. THE STUDENT RECOGNIZES THE INTERRELATIONSHIPS AMONG SCIENCE, TECHNOLOGY, ENVIRONMENT AND SOCIETY.

Benchmarks/Performance Standards:

By the end of grade 4

The student demonstrates the ability to:

a. describe how science and the tools of technology affect the student personally.

b. identify ways that people affect the environment.

c. recognize the individual as a part of these interrelationships.

By the end of grade 8

The student demonstrates the ability to:

a. describe the interrelationships among science, technology, environment, and society.

b. recognize the role of the individual and the community as a part of these interrelationships.

c. recognize the interdependence of the biological, physical and chemical aspects of science.

Outcome Statement:

4. THE STUDENT RECOGNIZES THE INTERRELATIONSHIPS AMONG SCIENCE, TECHNOLOGY, ENVIRONMENT AND SOCIETY.

Benchmarks/Performance Standards:

By the end of grade 12 or at exit

The student demonstrates the ability to:

a. qualify and quantify the roles of the individual and community in these interrelationships.

b. qualify and quantify the global perspective of these interrelationships.

c. evaluate the complexity of these interrelationships.

d. make decisions which lead to responsible behaviors by individuals, communities and nations.

e. analyze the interdependence of the biological, physical and chemical aspects of science.

Outcome Statement:

5. THE STUDENT APPLIES SCIENCE CONCEPTS AND COMPLEX THINKING SKILLS, AS APPROPRIATE, IN DECISION MAKING.

Benchmarks/Performance Standards:

By the end of grade 4

The student demonstrates the ability to:

a. apply basic science concepts from the biological and physical world to familiar situations.

b. act in an environmentally responsible manner.

c. think in a scientific manner.

By the end of grade 8

The student demonstrates the ability to:

a. think in a scientific manner.

b. distinguish between scientific evidence and personal opinion.

c. use complex thinking processes to solve problems and make decisions.

d. recognize that knowledge of the biological, chemical and physical world enhances decision making.

e. act in an environmentally responsible manner.

Outcome Statement:

5. THE STUDENT APPLIES SCIENCE CONCEPTS AND COMPLEX THINKING SKILLS, AS APPROPRIATE, IN DECISION MAKING.

Benchmarks/Performance Standards:

By the end of grade 12 or at exit

The student demonstrates the ability to:

a. recognize the importance of paradigms in science.

b. evaluate scientific evidence and distinguish it from personal opinion.

c. synthesize information from a variety of sources; evaluate sources for validity, reliability and significance.

d. integrate the biological, physical and chemical aspects of science in decision making.

e. act in an environmentally responsible manner.

Outcome Statement:

6. THE STUDENT IS AWARE OF THE HISTORY AND PHILOSOPHY OF SCIENCE AND RECOGNIZES THE CONTRIBUTIONS OF VARIOUS CULTURES TO SCIENCE.

Benchmarks/Performance Standards:

By the end of grade 4

The student demonstrates the ability to:

a. describe a variety of contributions made to science by various cultures, individuals and events.

b. describe how life was before and after significant scientific events.

By the end of grade 8

a. discuss the impact of various cultures, individuals, and events on the development of science.

b. discuss how science has impacted various cultures, individuals and events.

By the end of grade 12 or at exit

a. compare and contrast the impact of science on individuals, cultures and events.

b. compare and contrast the impact of cultures, individuals and events on science.

c. discuss the changing role of science.

d. discuss how present and future events may change civilization.

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NORTH DAKOTA

SOCIAL STUDIES

FRAMEWORK

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THE MISSION STATEMENT OF SOCIAL STUDIES EDUCATION IN NORTH DAKOTA

Social studies programs in North Dakota are needed to help prepare young people to identify, to understand, and to work to solve the problems that face our diverse nation and an interdependent world. Over the past several decades, the professional consensus has been that such programs need to include specific goals. These goals are knowledge, democratic values and skills. Programs that combine the acquisition of knowledge and skills, with the application of democratic values to life through social participation, present an ideal balance in social studies.

To facilitate the accomplishment of these goals the North Dakota social studies curriculum framework has four major objectives. They are to promote **1)** active and responsible citizenship; **2)** lifelong learning and problem solving; **3)** awareness and appreciation of diversity, and **4)** the maximum development of student's intellect and skills. Achieving these objectives requires education in history, geography, government, the law, economics, the social sciences and the humanities. It also requires that the students learn to speak and write clearly, read critically, think analytically, access information, and work cooperatively. Because the United States is a pluralistic society, social studies also needs to include the discussion of societal values and an exposure to divergent views. Since American Indians have a long and unique history in this state and since their government has a special political relationship emanating from the U.S. Constitution, it is expected that all students will be more aware of American Indian history, government and culture.

CONTENT OUTCOMES

SOCIAL STUDIES

1. The student analyzes major forces affecting world history, U.S. history, and North Dakota history from the prehistoric period to the present.

2. The student compares and contrasts how political institutions and systems, past and present, respond to internal and external conflict and change.

3. The student demonstrates civic competency through positive and active participation in the democratic institutions of our society.

4. The student finds, examines and uses, in a critical manner, social studies information resources.

5. The student analyzes and synthesizes basic documents of U.S. and North Dakota history.

6. The student understands and appreciates those who have struggled to gain human rights and human dignity.

7. The student analyzes local, national and world economic problems from the perspectives of producer, consumer, world citizen and decision maker.

8. The student evaluates individuals who have had an impact on history.

9. The student is knowledgeable of the unique legal and political relationships between the Sovereign Tribal Nations of North Dakota and the United States government.

10. The student understands, from the American Indian perspective, the unique and diverse Sovereign Tribal Nations in North Dakota.

11. The student applies the five themes of geography to social studies issues.

12. The student understands and appreciates cultural diversity and its role in history and in contemporary society.

13. The student is willing to use social studies perspectives in lifelong learning.

14. The student understands the importance of ethics and values and how they influence the behavior of individuals and society.

CONTENT OUTCOMES AND STUDENT PERFORMANCE STANDARDS

Outcome Statement:

1. THE STUDENT ANALYZES MAJOR FORCES AFFECTING WORLD HISTORY, U.S. HISTORY, AND NORTH DAKOTA HISTORY FROM THE PREHISTORIC PERIOD TO THE PRESENT.

Benchmarks/Performance Standards:

By the end of grade 4

The student demonstrates the ability to:

a. examine and understand the events, people and ideas that have contributed to the history of the United States.

b. examine and understand the events, people and ideas that have contributed to the history of North Dakota.

By the end of grade 8

The student demonstrates the ability to:

a. compare and contrast the various political, economic and social systems under which people live.

b. examine and internalize the social, economic and political history of North Dakota and of the United States through the Reconstruction of the South.

c. describe the multiple perspectives and contributions of past civilizations as a basis for understanding cultural diffusion and contemporary life.

d. analyze and apply how societies have been and are organized in the western and nonwestern world and how people have interacted throughout history.

By the end of grade 12 or at exit

The student demonstrates the ability to:

a. analyze and synthesize the major religious, political, cultural, economic and geographic forces affecting world and United States history from the prehistoric period to the present.

Outcome Statement:

2. THE STUDENT COMPARES AND CONTRASTS HOW POLITICAL INSTITUTIONS AND SYSTEMS, PAST AND PRESENT, RESPOND TO INTERNAL AND EXTERNAL CONFLICT AND CHANGE.

Benchmarks/Performance Standards:

By the end of grade 4

The student demonstrates the ability to:

a. compare and contrast historical and contemporary events and their effect on our state government and other institutions of our society.

By the end of grade 8

The student demonstrates the ability to:

a. describe the evolution of American democracy; its ideas, institutions and practices from colonial times to the present

b. develop an understanding of democratic institutions and civic competency through knowledge of and active involvement in political, social or economic issues.

By the end of grade 12 or at exit

The student demonstrates the ability to:

a. analyze and apply how political systems have responded to conflict and change.

b. interpret and analyze how political systems have affected, and continue to affect, the course of history.

Outcome Statement:

3. THE STUDENT DEMONSTRATES CIVIC COMPETENCY THROUGH POSITIVE AND ACTIVE PARTICIPATION IN THE DEMOCRATIC INSTITUTIONS OF OUR SOCIETY.

Benchmarks/Performance Standards:

By the end of grade 4

The student demonstrates the ability to:

a. examine the roles, rights and responsibilities of a citizen in a democratic society.

b. recognize the dignity of all people and seek justice by active involved citizenship.

By the end of grade 8

The student demonstrates the ability to:

a. affect local, national and international issues through active participation.

b. be a responsible and effective citizen.

By the end of grade 12 or at exit

The student demonstrates the ability to:

a. examine democratic institutions.

b. exercise civic competency through political involvement and community service projects.

Outcome Statement:

4. THE STUDENT FINDS, EXAMINES AND USES, IN A CRITICAL MANNER, SOCIAL STUDIES INFORMATION RESOURCES.

Benchmarks/Performance Standards:

By the end of grade 4

The student demonstrates the ability to:

a. locate and use relevant information from primary and secondary sources.

b. determine the difference between historical evidence and literary interpretations of history.

c. discuss current events based on a variety of printed and electronic media.

By the end of grade 8

The student demonstrates the ability to:

a. use and analyze social studies information resources with literary and artistic interpretations.

b. critically analyze contemporary issues from multiple sources and perspectives.

By the end of grade 12 or at exit

The student demonstrates the ability to:

a. make decisions based on the analysis of social studies information resources.

b. critically analyze visual and printed sources.

Outcome Statement:

5. THE STUDENT ANALYZES AND SYNTHESIZES BASIC DOCUMENTS OF U.S. AND NORTH DAKOTA HISTORY.

Benchmarks/Performance Standards:

By the end of grade 4

The student demonstrates the ability to:

a. recognize the basic documents of U.S. history.

By the end of grade 8

The student demonstrates the ability to:

a. know and understand the significance of the Declaration of Independence, the Constitution and the Bill of Rights.

b. know and understand the importance of the North Dakota State Constitution.

c. apply the concepts from these documents to a real life situation.

By the end of grade 12 or at exit

The student demonstrates the ability to:

a. analyze and synthesize knowledge of basic documents of U.S. history in a research paper.

Outcome Statement:

6. THE STUDENT UNDERSTANDS AND APPRECIATES THOSE WHO HAVE STRUGGLED TO GAIN HUMAN RIGHTS AND HUMAN DIGNITY.

Benchmarks/Performance Standards:

By the end of grade 4

The student demonstrates the ability to:

a. recognize the rights and dignity of all people in a multicultural world.

By the end of grade 8

The student demonstrates the ability to:

a. integrate the basic concepts of unity and diversity, tradition and change, power and politics, and liberty and equality to all social studies disciplines and to one's own life.

By the end of grade 12 or at exit

The student demonstrates the ability to:

a. interpret and analyze the concepts of freedom and economic security.

b. identify and appreciate those who have struggled to gain human rights and human dignity.

Outcome Statement:

7. THE STUDENT ANALYZES LOCAL, NATIONAL AND WORLD ECONOMIC PROBLEMS FROM THE PERSPECTIVES OF PRODUCER, CONSUMER, WORLD CITIZEN AND DECISION MAKER.

Benchmarks/Performance Standards:

By the end of grade 4

The student demonstrates the ability to:

a. examine economic problems and the variety of resources available in North Dakota and their effect on the community, nation and the world.

By the end of grade 8

The student demonstrates the ability to:

a. describe the economic concepts of wants and needs, supply and demand goods and services, scarcity, renewable and nonrenewable resources as they apply to national and world economic problems.

By the end of grade 12 or at exit

The student demonstrates the ability to:

a. compare and contrast the basic principles and systems of economics and the problems that are inherent to these systems.

b. analyze and investigate possible solutions to economic problems.

c. examine how global interdependence impacts many aspects of contemporary life.

Outcome Statement:

8. THE STUDENT EVALUATES INDIVIDUALS WHO HAVE HAD AN IMPACT ON HISTORY.

Benchmarks/Performance Standards:

By the end of grade 4

The student demonstrates the ability to:

a. recognize the contributions and/or importance of individuals in history.

By the end of grade 8

The student demonstrates the ability to:

a. understand and articulate the contributions and/or importance of individuals who have made a significant difference in history.

By the end of grade 12 or at exit

The student demonstrates the ability to:

a. analyze and evaluate the contributions and/or importance of individuals who have made a significant difference in history.

Outcome Statement:

9. THE STUDENT IS KNOWLEDGEABLE OF THE UNIQUE LEGAL AND POLITICAL RELATIONSHIPS BETWEEN THE SOVEREIGN TRIBAL NATIONS OF NORTH DAKOTA AND THE UNITED STATES GOVERNMENT.

Benchmarks/Performance Standards:

By the end of grade 4

The student demonstrates the ability to:

a. describe and explain that the Sovereign Tribal Nations of North Dakota are the indigenous people of North America and have their own lands and governments, which are separate from and, in addition to, the government of the United States and the government of the State of North Dakota.

By the end of grade 8

The student demonstrates the ability to:

a. identify, analyze, and demonstrate knowledge of dual citizenship which includes rights and responsibilities of both the Sovereign Tribal Nations of North Dakota and the government of the United States.

By the end of grade 12 or at exit

The student demonstrates the ability to:

a. identify, synthesize and apply knowledge about the unique roles and relationships between the Sovereign Tribal Nations of North Dakota and the government of the United States regarding treaty rights and responsibilities.

b. identify, synthesize, and apply knowledge of the roles and relationships between the Sovereign Tribal Nations and the government of the State of North Dakota.

Outcome Statement:

10. THE STUDENT UNDERSTANDS, FROM THE AMERICAN INDIAN PERSPECTIVE, THE UNIQUE AND DIVERSE SOVEREIGN TRIBAL NATIONS IN NORTH DAKOTA.

Benchmarks/Performance Standards:

By the end of grade 4

The student demonstrates the ability to:

a. distinguish and explain the unique cultural differences and similarities in beliefs and values of the traditional and contemporary lifeways of the diverse, Sovereign Tribal Nations of North Dakota.

By the end of grade 8

The student demonstrates the ability to:

a. compare, contrast, and explain the unique and dynamic nature of the traditional and contemporary beliefs, values, and lifeways of the diverse, Sovereign Tribal Nations of North Dakota.

By the end of grade 12 or at exit

The student demonstrates the ability to:

a. research, analyze, and synthesize how the traditional and contemporary beliefs and values are the basis for the lifeways of the diverse, Sovereign Tribal Nations of North Dakota and their members.

b. research, synthesize, and apply how the beliefs, values, and lifeways of the diverse, Sovereign Tribal Nations of North Dakota and their members contribute to the global society.

Outcome Statement:

11. THE STUDENT APPLIES THE FIVE THEMES OF GEOGRAPHY TO SOCIAL STUDIES ISSUES.

Benchmarks/Performance Standards:

By the end of grade 4

The student demonstrates the ability to:

a. locate on a world map major land masses, bodies of water, the United States and its neighbors.

b. describe the movement of people, natural resources, products and ideas across the nation.

c. describe how regions may be defined culturally, physically and politically or by a combination of these.

d. recognize the regions of the United States describing the geography, climate, resources, industries and occupations of each area.

By the end of grade 8

The student demonstrates the ability to:

a. identify and explain the importance of the five themes of geography: location, place, human-environmental interactions, movement and regions to social studies issues.

By the end of grade 12 or at exit

The student demonstrates the ability to:

a. comprehend the relationships between geographic location and contemporary and historic events.

b. use the five themes of geography as a foundation for geographic analysis.

Outcome Statement:

12. THE STUDENT UNDERSTANDS AND APPRECIATES CULTURAL DIVERSITY AND ITS ROLE IN HISTORY AND IN CONTEMPORARY SOCIETY.

Benchmarks/Performance Standards:

By the end of grade 4

The student demonstrates the ability to:

a. describe the cultural diversity that exists within and among societies.

By the end of grade 8

The student demonstrates the ability to:

a. analyze and discuss the multiple perspectives and contributions of past civilizations as a basis for understanding cultural diffusion and contemporary life.

By the end of grade 12 or at exit

The student demonstrates the ability to:

a. apply the concepts of cultural diversity in order to analyze history and contemporary society.

Outcome Statement:

13. THE STUDENT IS WILLING TO USE SOCIAL STUDIES PERSPECTIVES IN LIFELONG LEARNING.

Benchmarks/Performance Standards:

By the end of grade 4

The student demonstrates the ability to:

a. use social studies information to make decisions and solve problems.

By the end of grade 8

The student demonstrates the ability to:

a. examine the interrelationships of history, geography, the social sciences and the humanities.

b. discuss the complexities inherent to an ever-changing world.

By the end of grade 12 or at exit

The student demonstrates the ability to:

a. compare and contrast issues and events of the past to understand the present and gain insights into the future.

b. develop educated opinions and express them in various forums.

Outcome Statement:

14. THE STUDENT UNDERSTANDS THE IMPORTANCE OF ETHICS AND VALUES AND HOW THEY INFLUENCE THE BEHAVIOR OF INDIVIDUALS AND SOCIETY.

Benchmarks/Performance Standards:

By the end of grade 4

The student demonstrates the ability to:

a. recognize that laws enable people to live and work in society.

By the end of grade 8

The student demonstrates the ability to:

a. examine how society is governed by laws which influence personal behavior and which seek to provide for the common good.

By the end of grade 12 or at exit

The student demonstrates the ability to:

a. evaluate perceptions, stereotypes, and prejudices directed toward individuals, groups, cultures and nations.

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The History-Social Science Framework, California State Department of Education, Sacramento, 1988.

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GLOSSARY

Graduation Outcome: A statement of what a student should know and be able to do as a result of K-12 curriculum and instruction. An outcomes statement incorporates content and performance standards.

Content Outcome: A statement that describes the knowledge and skills that learners should acquire in a particular subject area.

Student Performance Standards: Statements that describe tasks or demonstrations which could be assessed and the knowledge and skills identified as important to a subject area. (Note: some prefer to use this term more broadly to describe the entire set of demonstrations that a student would perform to satisfy the standards of a particular subject area.)

Benchmarks: Those performance standards a student should be able to successfully demonstrate at designated grade levels.

Exemplary Standards: Performance standards that demand exceptional effort on the part of students who merit special recognition.

Alternative Assessments: A means of supplementing traditional forms of assessment such as multiple choice and true/false tests. Alternative assessments provide ways of measuring a learner's success at meeting performance standards.

Authentic Task: A form of alternative assessment that can also be used as part of the curriculum. An authentic task is usually an open-ended task that closely mimics the complexity of real world problems. Such tasks help students find out how well they apply essential knowledge and skills.

Portfolio: A collection of student work that provides a means of assessment which involves the individual student in the process.